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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/724,536	11/28/2003	Scott E. Axelrod	YOR92003-0618US1	1863
7590 04/11/2008 Thu Ann Dang Intellectual Property Law Dept IBM Corporation P O Box 218 Yorktown Heights, NY 10598			EXAMINER WOZNIAK, JAMES S	
			ART UNIT 2626	PAPER NUMBER
			MAIL DATE 04/11/2008	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/724,536

**Applicant(s)**

AXELROD ET AL.

**Examiner**

James S. Wozniak

**Art Unit**

2626

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 05 January 2008.  
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-14 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1-14 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.  
10) ☒ The drawing(s) filed on 28 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☐ Information Disclosure Statement(s) (PTO-8508)  
4) ☐ Interview Summary (PTO-413)  
5) ☐ Notice of Informal Patent Application  
6) ☐ Other: \_\_\_\_\_  
Paper No(s)/Mail Date \_\_\_\_\_

## **DETAILED ACTION**

### ***Response to Amendment***

1. In response to the office action from 8/6/2007, the applicant has submitted an amendment, filed 1/5/2008, amending independent claims 1 and 7, while arguing to traverse the art rejection based on the limitation regarding extracting a multitude of speech features directly from input speech (*Amendment, Pages 10-16*). Applicant's arguments have been fully considered, however the previous rejection is maintained due to the reasons listed below in the response to arguments.
2. In response to the amended specification, the examiner has withdrawn the previous objection directed towards minor informalities.
3. In response to the amendment of claim 7, the examiner has withdrawn the previous 35 U.S.C. 112, second paragraph rejection.

### ***Response to Arguments***

4. Applicant's arguments have been fully considered but they are not persuasive for the following reasons:

With respect to **Claims 1 and 7**, the applicants argue that Vergyri ("*Integration of Multiple Knowledge Sources in Speech Recognition Using Minimum Error Training*," 2000) fails to teach extracting a multitude of speech features directly from input speech. In support of this position, the applicants argue that the features of Vergyri are not directly extracted from the speech data, but instead are extracted indirectly from a lattice (*Amendment, Pages 10-12*).

In response, the examiner notes that the claim scope of "directly from input speech" does encompass additional processing performed between receiving input speech and extracting a feature. More specifically, with respect to Fig. 5, it is shown that there are steps of applying a model and a lattice between receiving speech data and extracting the features of speech (*Fig. 5, Elements 5100, 5200, 5300, and 5400*) and Fig. 4 shows that a lattice is input into a feature extractor. Also important to note is Page 7, lines 13-23 of the specification where it is detailed that feature extraction involves intermediate processing in the form of matching processing, word sequencing information, and the like. Thus, even though the claim recites "directly from input speech", the claim scope of "directly" includes intermediate processing, and thus, Vergyri's lattice features argued by the applicants anticipate the currently claimed invention.

In response to applicants' argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (*i.e., number of parameters from the set of extracted features and determined algorithmically depending on the variability and size of the training data, Amendment, Pages 12-14; lambda exponent training for every word and how to compute a normalization factor according to Equation 2 of the specification, Pages 15-16*) are not recited in the rejected claim(s). Although the claims are

interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Thus, for at least the above reasons, the applicants' arguments have been fully considered, but are not convincing.

With respect to **Claim 2**, the applicants argue the difference between the log-linear model of the disclosure (*Page 13, Equation 2*) and the log-linear model taught by Vergyri by pointing to the number of lambda parameters used in the applicants' log-linear model. In response, the examiner notes that the claimed invention merely requires the use of a log linear model to model a posterior probability, which is taught by Vergyri (*Pages 100-101*) and acknowledged by the applicants (*Amendment, Page 17*). Thus, Vergyri teaches the subject matter recited in claim 2. The features argued by the applicants are not claimed.

The applicants' arguments with respect to **Claim 3** are directed to the number of features utilized by Vergyri as compared to the applicants (*Amendment, Pages 17-19*). This feature is not claimed. Instead claim 3 requires that speech features are "at least one of asynchronous, overlapping, and statistically non-independent speech features". Since this feature is taught by Vergyri (*Page 18*), Vergyri teaches the subject matter recited in claim 3.

With respect to **Claim 4**, the applicants argue that Vergyri merely states a statistical fact that without sufficient data parameter estimation can be very poor instead of extracting features from incomplete data (*Amendment, Pages 19-20*). In response, the examiner notes that Vergyri actually teaches that the effects of incomplete speech data result from bad pronunciation, noise, or insufficient data are overcome through the benefits of her disclosed method/system (*Page 14*). Thus, while it is true that these incomplete data types traditionally lead to errors in speech

recognition, Vergyri seeks to overcome them by processing them with a log-linear model. Thus, for at least the above reasons, the applicants' arguments have been fully considered, but are not convincing.

With respect to **Claim 5**, the applicants' arguments (*i.e.*, "*Vergyri does not teach or suggest loopback*", *Amendment, Pages 20-21*) fail to comply with 37 CFR 1.111(b) because they amount to a general allegation that the claims define a patentable invention without specifically pointing out how the language of the claims patentably distinguishes them from the references. In response, however, the examiner notes that Vergyri discloses parameter optimization for error minimization through iterative processing (*Pages 106-109 and 112*), which anticipates the claimed loopback.

The applicants arguments with respect to **Claim 6** regarding unclaimed features (*Amendment, Pages 21-22*), are similar to those directed towards claim 3. In regards to such arguments, see the response directed towards claim 3.

Further dependent claims 8-12 contain subject matter respectively similar to claims 2-6. As such, the response directed to claims 2-6 would also apply to claims 8-12.

### ***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. **Claims 1-14** are rejected under 35 U.S.C. 102(b) as being anticipated by Vergyri (*"Integration of Multiple Knowledge Sources in Speech Recognition Using Minimum Error Training,"* 2000).

With respect to **Claim 1**, Vergyri discloses:

A features extractor that extracts a multitude of speech features directly from input speech (*means for extracting multiple types of speech feature information, Pages 1, 13, 18-19, 52, and 98-99*);

A log-linear function that receives the multitude of speech features obtained from the input speech and determines a posterior probability of a plurality of hypothesized linguistic units given the extracted multitude of speech features (*log-linear modeling function means that determines a posterior probability of a word sequence given extracted speech features from multiple information sources, Pages 100-101*); and

A search device that analyzes the posterior probabilities determined by the log-linear function to determine a recognized output of unknown utterances (*decoding means performing speech recognition using the log-linear model, Pages 98, 104-109, 112; and word sequence output from a decoder, Fig. 1.1, Page 1*).

With respect to **Claim 2**, Vergyri discloses:

The log linear function models the posterior probability using a log linear model (*log-linear sentence model, Page 100-101*).

With respect to **Claim 3**, Vergyri further discloses:

The speech features comprise at least one of asynchronous, overlapping, and statistically non-independent speech features (*overlapping speech features, Page 18*).

With respect to **Claim 4**, Vergyri further discloses:

At least one of the speech features extracted is derived from incomplete data *(use of a log-linear model for sparse or insufficient speech data, Page 14)*.

With respect to **Claim 5**, Vergyri further discloses:

The system of claim 1, further comprising a loopback *(iterative processing (loopback) for error minimization (i.e., likelihood optimization), Pages 24-29 and 106-109)*.

With respect to **Claim 6**, Vergyri further discloses:

The features are extracted using direct matching between test data and training data *(extracted feature measurements resulting from speech recognition matching, Pages 9 and 109-126)*.

**Claims 7-12** contain subject matter similar to Claims 1-6, and thus, are rejected for the same reasons.

With respect to **Claims 13-14**, Vergyri further discloses:

The features are extracted using Gaussian model identities at each time frame *(Gaussian densities utilized in matching for feature extraction, Pages 60 and 101)*.

### ***Conclusion***

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO



MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to James S. Wozniak whose telephone number is (571) 272-7632. The examiner can normally be reached on M-Th, 7:30-5:00, F, 7:30-4, Off Alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Edouard can be reached at (571) 272-7603. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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